NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

POND SEALING OR LINING

GEOSYNTHETIC LINING

(No.)
CODE 521H CA INTERIM

DEFINITION

Installing a lining of geosynthetic material in a pond to impede or prevent excessive water loss.

Scope

This standard applies to the sealing of ponds with a lining made of high density polyethylene (H.D.P.E.).

PURPOSES

To reduce seepage losses in ponds to an acceptable level.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where water loss from a pond through leakage is or will be of such proportion as to prevent the pond from fulfilling its planned purposes.

CRITERIA

Ponds to be lined shall be constructed to meet NRCS standards from irrigation regulating reservoirs (552B), irrigation storage reservoirs (436), ponds (378), waste treatment lagoons (359), waste storage facility (313), or wildlife watering facilities (648), as appropriate.

CONSIDERATIONS

Water Quantity

1. Effects upon components of the water budget, especially effects on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation and ground water recharge.

2. Potential use for irrigation water management.

Water Quality

1. Effects on the movement of silt, pathogens, and soluble materials carried by seepage toward the ground water.

2. Short-term and construction related effects of this practice on the quality of the water resource.

3. Effects on the wetlands or water related wildlife habitat.

4. Effects on visual quality of downstream water resources.

5. Effects on the use and management of nutrients and pesticides and their effect on surface and ground wate quality.

Material

Geosynthetic linings shall be of high quality materials, have a thickness of 30 mils or greater, and shall be certified by the manufacturer to be suitable for this use. Pigmented high density polyethylene materials that are highly resistant to bacteriological deterioration shall be acceptable base materials.

The quality of geosynthetic linings shall meet or exceed the attached specifications form materials for H.D.P.E., or shown in Table 1.

Material Specifications

1. The H.D.P.E. liner shall be of 30 mil or greater in thickness and conform to the following minimum physical properties.

Table 1

Test Description	Test Method
Thickness	ASTM D-1593
Specific Gravity	ASTM D-792
Ultimate Tensile Strength	ASTM D-882
Dart Impact	ASTM D-1709
Modulus of Elasticity (Lbs./Sq. in.)	ASTM D- 882
Water Vapor Permeability	ASTM E-96
Low Temperature	ASTM D-746
Tear Resistance	ASTM D-1922
Initial Tear Resistance	ASTM D-1004
Dimensional Stability	ASTM D-1204
Volatile Loss	ASTM D-1203
Resistance to Soil Burial	ASTM D-3083
Tensile Strength at Break	ASTM D-638
Ozone Resistance	ASTM D-1149
Puncture Resistance (P.S.I.)	FIMS 101B
Seam Strength	ASTM D-4545

2. The liner material shall contain a minimum of 2 percent by weight of carbon black.

3. The material shall be resistant to prolonged exposure to ozone and ultraviolet light.

Other Materials

1. High density polyethylene pipe and fittings shall be Schedule 40. The H.D.P.E. compound used in pipe and fittings shall be suitably protected against degradation by ultraviolet light by means of well dispersed carbon black.

2. Resin used for fusion joining sheets and sheet to pipe shall be H.D.P.E. produced from, and the same as, the sheet resin. Physical properties shall be the same as those of the resin used in the manufacture of the sheet. The resin shall be supplied in black and/or natural color. Natural resin shall be colored black through addition of 2.0-3.5 percent batch colorant before use.

Endangered Species Considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

PLANS AND SPECIFICATIONS

Plans and specifications for sealing ponds with geosynthetic linings shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan must be prepared by the Designer for use by the owner or other responsible for operating this practice. The plan should provide specific instructions for operating and maintaining the system to insure that it functions properly. It should also provide for periodic inspections and prompt repair or replacement of damage components.